Ghost Trap Servo Controller Board
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### http://www.hyperdynelabs.com

Overview

The trap servo board will fit inside a ghost trap and allow you to motorize the trap doors using a standard off the shelf servo. The board can also be interfaced to our ghost trap light kit, which commands the lights to come on automatically when the doors are in the down position. Here is a pic of the unit:

Servo Connections

Any off-the-shelf 4.5-6V servo will work, as long as it has enough torque to lift your trap doors. You can plug your servo right onto the controller board. A 3-pin header is there to connect the servo**. NOTE THE POLARITY! The servo ground is near the small resistor on the end of the board, and the servo control line is near the main chip. Make sure you plug the servo in correctly or it can be damaged!**
The black wire on the servo is GROUND (-). The red is POWER (+). The control wire is typically yellow or white. A picture is shown below.
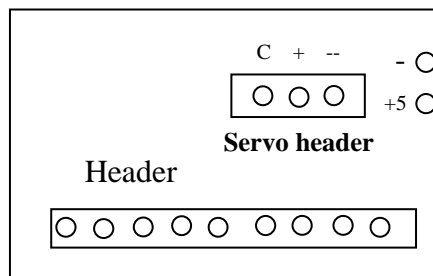
The board has a header of 9 pins that are used to hook up the external "activation" interface, i.e. the button used to tell the servo when to go up and down. The header has labels on it that correspond to the pin function. Pin 1 is the servo up/down interface pin. Pin "L1" is an output to control our external trap light kit (optional). When the servo is in the down position, the L1 commands our trap light kit to activate its blinking LED and bar graph display. This output is not needed if you have your own trap lighting source.

The last 4 pins of the header are the common leads, and you should connect one of them to the other side of the pushbutton. The board runs of a 9V battery or other DC source < 12V. All other header pins are unused in this kit!

Servos Tested

Here is a list of the tested servos with the board:

Tower Hobbies: Hitec HS-77BBJ, http://www2.towerhobbies.com/cgi-bin/WTI0001P?Q=1&I=LXN620
Jameco: #157067 - HS303 robotic servo, http://www.jameco.com
FMA Direct: PS30, https://www.fmadirect.com/home.htm

NOTE: The tested servos were able to travel 120 degrees with 1-2ms input control pulses.

Button and LED Hookup

Here are the connections for the pushbutton and the external light kit output (optional). The pushbutton is used to control the servo direction and is the only NECESSARY wire hookup.
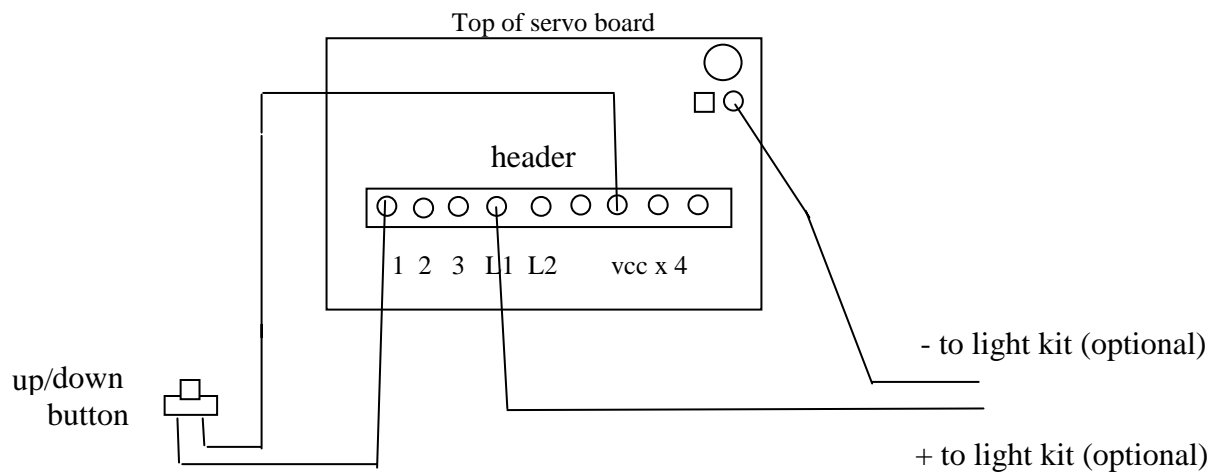

NOTE: If you have our optional light kit, you can control the activation of the light kit using the above trigger wires. The + side goes to the light board trigger + wire, and the – side goes to the light board trigger – wire. When the trap doors are closed, the above trigger wires have +5V on them. When the trap doors are open, the trigger wires have 0V on them. You can also drive a separate relay with these wires, as long as the relay inductor does not require more than 20mA of current to energize. You may also need a diode with the relay to provide spike protection.

Servo Speed Selection

When the board powers up, it reads the slide switch input for the desired servo speed. There are 2 settings: 1) slow servo speed, 2) fast servo speed.
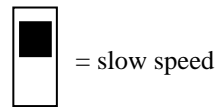
NOTE: Upon powerup, the servo will also reset itself at high speed. The servo will go to the down position automatically, so the board knows where the door position is. The speed switch is only read at bootup, so if you change it you will have to power cycle the board for the new speed to take effect.

Switch positions:
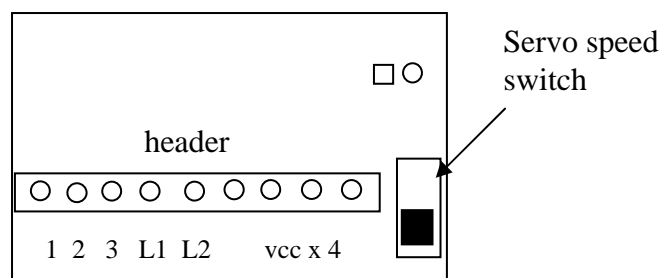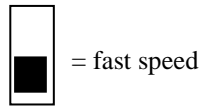
■ (top black) = fast speed   ■ (bottom black) = slow speed

Radio link board to control servo movement

If you would like to use an RF link to control the servo, you can do this also. One kit that has been tested is from electronickits.com.

http://www.electronickits.com/kit/complete/elec/ck1617.htm

Using this kit, you trap pedal wont need a long cable. You can even trigger it from across the room.

You can use the momentary relay output on the RF kit and connect it to the button input wires on the servo board. Note that the RF receiver board requires 12V, so you will have to use a 12V source to get reliable operation.

Installing two servos for direct drive hookup

If you want to use two servos, one to raise each door, then this is possible if you use a servo Y-cable and 2 servo motors. Simply connect the servos to the Y-cable and plug the common end into the servo board. You can purchase a Y-cable from us or get one from Tower Hobbies (www.towerhobbies.com)

NOTE: Both motors will turn the same direction. So to get them to open both doors you need to reverse one. If you want to reverse the direction of one servo, simply turn it around. Below is a simple install diagram showing this. Your mechanical linkage will vary based on the size of your servo horn.

Mechanical linkage   Trap doors   Servo horn

Servo 2

Trap box   Servo 1

Servo board   y-cable

Button cable
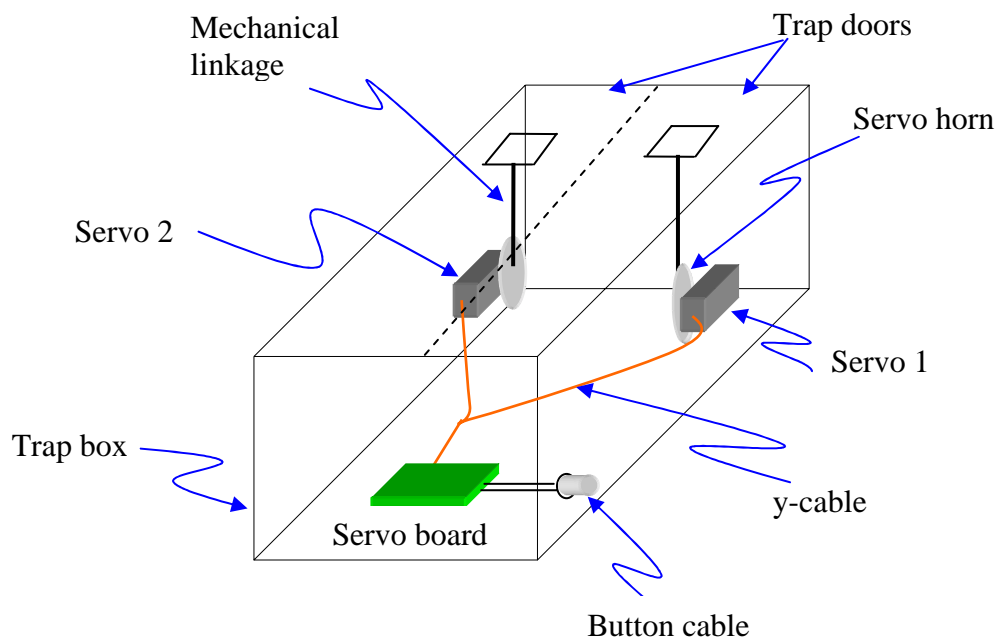
NOTICE: There is no warranty on kits!! It is your responsibility to install the board. Kits cannot be returned! This kit can consume alot of current. Be careful if you plan to use a battery source that is capable of delivering alot of current. Contact a professional if you need assistance. Hyperdyne Labs assumes no responsibility for the misuse of this kit.